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COMMITTEE OF EXPERTS ON THE
TRANSPORT OF DANGEROUS GOODS

Sub-Committee of Experts on the
Transport of Dangerous Goods

REPORT OF THE SUB-COMMITTEE OF EXPERTS ON ITS ELEVENTH SESSION
(Geneva, 4-15 December 1995)

Addendum 2

Annex 3

REPORTS OF THE WORKING GROUPS ON THE HARMONIZATION OF CLASSIFICATION CRITERIA
(see ST/SG/AC.10/C.3/22, paras. 174 to 177)

Part I - Report of the Working Group on Harmonization of Classification Criteria for Reactive Substances

Part II - Report of the Working Group on Harmonization of Classification Criteria for Flammable Substances

Note by the secretariat: These working groups were convened in the context of cooperation with the International Labour Office (ILO), the Inter-Organization Programme on Sound Management of Chemicals (IOMC) and follow-up to the United Nations Conference on Environment and Development (UNCED) (Agenda 21, Chapter 19, Programme Area B).

Part I - Report of the Working Group on Harmonization of Classification Criteria for Reactive Substances

GENERAL

1. The Working Group reconvened in plenary during the 11th session of the Sub-Committee on the Transport of Dangerous Goods (4-15 December 1995). In the absence of Mr. R. Woodward (United Kingdom), Mr. L. Grainger, served as Chairman and Mr. I. Obadia (ILO) as rapporteur. Experts were asked to review document ST/SG/AC.10/C.3/R.610/Rev.1 paragraph by paragraph, as presented by the United Kingdom and in the light of new related documents and Information papers prepared to answer a number of issues raised at the first meeting of the Group in July 1995. The expert from the United Kingdom identified for the Group parts of the document which were revised as a result of the July 1995 Meeting.

2. The conclusions of the Working Group, including those on the documents and information papers presented by experts in relation to harmonization of reactive substances are reported following the layout of ST/SG/AC.10/C.3/R.610/Rev.1. Discussion on the Summary of Recommendations is reported last. Items for consideration at the July 1996 session of the Working Group are listed in the last paragraph of the report.

PART 1: EXPLOSIVE SUBSTANCES

Definitions

3. The proposed text for an Explanatory Note to be added to the UN definitions (paragraph 8) was accepted without discussion.

4. The expert from Germany introduced an information paper (INF.43) on harmonized definitions, test methods and classification criteria for explosive substances. The paper sought to propose a new rationale for classifying the hazard "explosive" in terms of explosive substances and potentially explosive substances so as to differentiate between intentional and unintentional explosives. The expert declared that such an approach would fit better a globally harmonized system by providing the necessary criteria for the supply side without modifying fundamentally the existing transport requirements.

5. As a result of the debate, some experts felt that proposals for a new scheme for classifying explosive substances were out of context. Other experts believed that the proposal by Germany was innovative and should not be discarded without further consideration. The Working Group asked for written comments to be sent to the expert from Germany before the end of January 1996 and that the experts from Germany and United Kingdom team-up in elaborating a proposed text for Revision 2 of document ST/SG/AC.10/C.3/R.610 due for the June 1996 session.

Test methods

6. The expert from the United States recommended that references to Test Series 1 to 3 should be replaced by references to Test Series 2 and 3 in paragraphs 1(b), 1(f), 9(a), 9(c), 10 (b), 10 (g), and 11 (h) of ST/SG/AC.10/C.3/R.610/Rev.1. The proposal by the expert from China to (document INF.32) to retain only Test series 2 and 3 as a basis for acceptance procedure for Class 1 dangerous goods was presented in the context of global harmonization. The Working Group recognized that the question raised by the expert from China concerning the need for Test Series 1 was a good one but a number of experts did not support the deletion of Test Series 1 at this time. It was also noted that the question was related to the proposals put forward by Germany in document INF.43. The expert from China agreed to resubmit INF.32 as a formal paper for discussion at the July 1996 session of the Working Group. The expert from Germany agreed to submit a new document based on INF.43 to the July 1996 session. Any amendment to the Test Series quoted in various parts of ST/SG/AC.10/C.3/R.610/Rev.1 would await the Working Group's decisions following discussion in July 1996.

Classification criteria

7. No modifications were proposed for the text in paragraph 10.

Consequences for harmonization

8. Two documents were presented on the subject of screening test procedures for classes 1, 4 and 5: ST/SG/AC.10/C.3/R.672 by CEFIC and INF.26 by the United Kingdom. After recognizing the value and complementarity of both documents, the Working Group felt that the highly technical nature of the subject made it difficult to immediately evaluate such a complex procedure. It was emphasised in discussion that each screening level should be a conservative level, so that borderline cases would require full testing. The expert from the United States as well as other experts suggested that ST/SG/AC.10/C.3/R.672 be

reformatted into a set of voluntary guidelines or general guidance. The expert from CEFIC agreed to revise the document in the light of these suggestions and those in document INF.26 and invited interested experts to take part in an informal meeting on the subject to be hosted by CEFIC in January 1996.

PART 2: ORGANIC PEROXIDES

Definitions

9. No modifications were proposed to the text in paragraph 12.

Test methods

10. The text in paragraph 13, which was modified to replace in the third line of 12 (b) the words "but noting" by the words "and noting", was accepted without further discussion.

Classification criteria

11. The expert from the United Kingdom referred to the two different cut-off levels existing in the European Union supply legislation and in transport regulations, the European Union legislation being slightly more stringent. Referring to informal discussions which took place recently, the expert from Germany reported that the European Commission was concerned about the fact that adoption of the UN available oxygen limits as a basis for a globally harmonized system would result in a lowering of the safety level in supply legislation in European Union Member States and suggested two hazard levels in the harmonized schemes one of which would not have to be used in transport regulations. Peroxides were more likely to decompose during use but not during transport. The expert from the United Kingdom did consider this difference in safety levels between the European Union supply legislation and transport regulations criteria but felt that it was not significant. Following a question from the Chairman with regard to European Commission position, the representative of the European Commission proposed to submit a document on the subject for discussion at the July 1996 session of the Working Group. The European Commission objection to paragraph 14 (g) was noted.

Consequences of harmonization

12. The expert from the United States noted that paragraph 15 of ST/SG/AC.10/C.3/R.610/Rev.1 did not include recommendations and considered that it

should be deleted. The expert from the United Kingdom recalled that the final version of ST/SG/AC.10/C.3/R.610 was meant to serve as a basis for further negotiations based on policy issues and that the inclusion of information about possible consequences was a very important element in the final decision-making process. Following this explanation, paragraph 15 was accepted without further discussion or modification.

PART 3: OXIDIZING SUBSTANCES

13. No modifications were proposed to Part 3 (paragraphs 16 to 26). However, the expert from Germany had doubts about the reliability of ISO Standard 10 156. The expert from United Kingdom would look into the subject, and would let the expert from Germany know his views before the July 1996 session. The expert from Germany offered to investigate the matter by testing and to report on the results (see also INF.44).

PART 4: PYROPHORIC SUBSTANCES

14. No modifications were proposed to Part 4 (paragraphs 27 to 30).

PART 5: SELF-HEATING SUBSTANCES

15. No modifications were proposed to Part 5 (paragraphs 31 to 34).

PART 6: SELF-REACTIVE OR EXOTHERMIC SUBSTANCES

16. No modification was proposed to Part 6, paragraphs 35 to 37.

Related issues

17. The Working Group considered two related documents on substances related to self-reactive substances (SRSRS) and desensitized explosives, one by the expert from the United Kingdom on global harmonization of classification of reactive substances (ST/SG/AC.10/C.3/R.663) and one by the expert from the United States (INF.11). Both documents had already been discussed to some extent in plenary.

18. The main idea presented in United Kingdom document ST/SG/AC.10/C.3/R.663 was to solve the problems related to classification of SRSRS and desensitized explosives by merging the two groups into one. INF.11 dealt with SRSRS alone. After lengthy discussion the view of the meeting emerged that although separate identification of SRSRS was not

justified. There was a general wish to retain a separate identification of desensitized explosives. The expert from the United Kingdom asked for more detailed comments on ST/SG/AC.10/C.3/R.663 by mid-January, after which it would prepare a revised ST/SG/AC.10/C.3/R.663, in close consultation with the expert from the United States in the light of INF.11, for the next meeting of the Working Group.

19. The expert from Germany raised a number of questions which needed to be reflected in ST/SG/AC.10/C.3/R.610/Rev.2. The first concerned the physical properties of the substances being tested. UN tests are generally for substances in the state which they are presented for transport, whereas other tests change the physical state of the substance (eg by grinding) to test the intrinsic physical properties. This is a problem, as some substances may change their properties due to modification of their physical state during processing or manufacturing. Although this issue was related to global harmonization, it needed to be resolved in a manner consistent with transport requirements. He proposed that a statement concerning the implications of this issue for classification under a globally harmonized system, be included in ST/SG/AC.10/C.3/R.610/Rev.2. The expert from the Netherlands pointed out that since the UN testing was carried on packaged substances, it could not be used for the purpose of supply legislation. The expert from the United States indicated that the UN Recommendations on the Transport of Dangerous Goods contained provisions on the subject and agreed that a reference to the "most common properties" of substances would be useful. The Working Group decided that a rapid solution could not be entertained at this time and that the problem should be reflected in ST/SG/AC.10/C.3/R.610/Rev.2.

20. The second point raised by Germany referred to unstable gases such as acetylene and ethylene oxide. Definitions, tests and criteria for unstable gases should be provided in a globally harmonized system, even where these would not be used for transport. The expert from the Netherlands stated that although unstable gases were currently identified in RID/ADR, this would be removed as from 1.1.1997 as part of the alignment of European land transport regulations with UN Recommendations on the Transport of Dangerous Goods. There was little interest in the Working Group in re-visiting this topic, but the expert from Germany was invited to propose a text on how this matter could be dealt with in the final report.

21. The third point concerned ammonium nitrate and ammonium nitrate fertilizers as a special group of substances. After a debate on the current multiple UN classifications of ammonium nitrate fertilizers and their explosive properties, it was agreed that no changes to the UN scheme should be envisaged. The expert from Germany offered to present a paper dealing with this special group of substances to the next session.

PART 7: SUBSTANCES WHICH REACT WITH WATER GIVING FLAMMABLE GASES

Definitions

22. Already started in plenary, discussion concerning the proposal by the expert from the United States (document ST/SG/AC.10/C.3/R.702) to cover both flammable and toxic gases emitted by water reactive substances under division 4.3, was continued in the Working Group session. The majority view was that division 4.3 should continue to deal solely with flammable gas evolution. However, it was agreed that the wider issue of water reactive substances which emit gases other than flammable gases warranted a new Part 8 of ST/SG/AC.10/C.3/R.610/Rev.2 reflecting discussion at this meeting. The expert from Canada also volunteered to prepare a paper on this topic for discussion at the July 1996 session.

Test methods

23. The expert from Germany presented document ST/SG/AC.10/C.3/R.676 in which a proposal to amend the description of the test procedure UN N5 to specify the use of 10-20 ml water and 10 g of substance as a basis for the measurement of the quantity of evolved gases. After debate, it was agreed that these values could be introduced as an example rather than a specification in the final text and the expert from the United Kingdom was requested to find proper rewording of the proposal and include it in ST/SG/AC.10/C.3/R.610/Rev.2. The document also contained a proposal to amend the description of the test procedure concerning the measuring intervals for substances reacting violently, which was discussed in plenary session by the Sub-Committee.

Classification criteria

24. No specific modifications to the text of paragraph 41 were proposed.

Consequences of harmonization

25. No specific modifications to the text of paragraph 42 were proposed.

SUMMARY OF RECOMMENDATIONS

26. It was agreed that the Summary would be restructured and revised in the light of the above discussions.

GENERAL CONSIDERATIONS

27. In the course of discussions on harmonization of criteria for reactive substances, a number of operational and philosophical problems related to global harmonization were identified. In a number of documents, the proposals related to global harmonization and those related to transport regulations were not sufficiently differentiated. The Working Group was reminded that a number of deadlines such as the convening of the 2nd IFCS in February 1997 in Ottawa, of the meeting of the CSD in mid 1997 and the UN General Assembly in the fall of 1997, made it imperative to complete the task of the Working Group at the July 1996 session of the Sub-Committee. Experts had to concentrate on the key elements which could easily be extended to a global system without major modification of the UN Recommendations on the Transport of Dangerous Goods. Areas which needed further consideration for implementation by the supply side should be identified as such and forwarded to the IOMC for consideration.

ANNEX: CLASSIFICATION CUT-OFF POINTS FOR ORGANIC PEROXIDES

28. No specific modifications were proposed.

KEY ITEMS FOR CONSIDERATION AT THE NEXT SESSION OF THE WORKING GROUP

29. The Working Group agreed that the following items would need to be reviewed at or prepared for the next meeting:

(a) a fully revised version of document ST/SG/AC.10/C.3/R.610/Rev.1 by the expert from the United Kingdom, including the Summary of recommendations;

(b) a revised version of document ST/SG/AC.10/C.3/R.663 by the expert from the United Kingdom and INF.11 by the expert from United States through mutual consultation;

(c) resubmission of INF.32 as a formal revised document by the expert from China;

(d) submission by the expert from Germany of INF.43 as a formal document;

(e) submission by the expert from Canada of a document on the emission by water reactive substances of gases other than flammable gases;

(f) a revised version of document ST/SG/AC.10/C.3/R.672 by the representative of CEFIC based on results of a meeting to be hosted by CEFIC at the end of January 1996;

(g) submission by the representative of the European Commission of a paper on organic peroxides.

ADOPTION OF THE REPORT

30. The Working Group adopted the report on its second session.

Part II - Report of the Working Group on Harmonization of Classification Criteria for Flammable Substances

GENERAL

1. The second session of the Working Group on Harmonization of Classification Criteria for Flammable Substances was held on 12 and 13 December 1995 during the eleventh session of the Sub-Committee of Experts under the chairmanship of Mr. G. Oberreuter (Germany). Various experts from all delegations participating at the eleventh session of the Sub-Committee attended the meeting.

2. The Working Group worked on the basis of the report on its first session (ST/SG/AC.10/C.3/20/Add.2, Part II), the report of the Ottawa Working Group (ST/SG/AC.10/R.493) and the proposals which had been carried forward or new submissions as listed in a draft agenda prepared by the Chairman (Information paper INF.42).

CLASSIFICATION CRITERIA FOR FLAMMABLE GASES AND AEROSOLS

Flammable gases

Document : ST/SG/AC.10/C.3/R.678 (Germany)

3. The expert from Germany proposed a definition for flammable gases in accordance with the offer he made at the last session to take account of the conclusions that the safety levels existing at present for the different protection purposes should not be lowered in the harmonized approach. The proposed definition was:

> "Flammable gases are gases or gas mixtures which, at room temperature and atmospheric pressure, have an explosion range in mixture with air".

He said that this definition would cover a range of gases larger than the one covered by the definition in paragraph 1.17.1 of the UN Recommendations on the Transport of Dangerous Goods for division 2.1 used in transport regulations, and would be consistent with the definition used for the European Union supply system and the related test method A.11.

4. The expert from the United States preferred to use the definition in the UN Recommendations, i.e.:

"Gases which at 20 °C and a standard pressure of 101.3 kPa:

(a) are ignitable when in a mixture of 13 % or less by volume with air; or

(b) have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit. Flammability should be determined by tests or by calculation in accordance with methods adopted by ISO (see ISO 10 156:1990) where insufficient data are available to use these methods, test by a comparable method recognised by a national competent authority may be used."

He said that this definition was also used in his country for the purpose of work safety and he felt that it better corresponded to the real risks presented in practice, while the more general definition proposed by Germany would cover gases which, because of their limited flammable range, would not be likely to cause any danger in practice.

5. The representative of CEFIC said that he preferred the solution proposed by Germany, which would be more suitable for regulatory systems other than transport regulations; he also said that the fixed conditions of temperature (20 °C) and pressure (101.3 kPa) would be impracticable taking account of usual laboratory conditions for testing which should be simply referred to as "normal conditions of temperature and pressure".

6. Suggestions were made that the definition in the UN Recommendations could be retained, but that the European Union test method A.11 could be added as an example of a test method comparable to the methods in ISO 10 156:1990. The expert of the United States said that in that case the standard ASTM E 681-85 should also be referred to as a comparable method.

7. A member of the secretariat drew attention to the fact that, though paragraph 1.17.1 of the UN Recommendations refer to ISO 10 156:1990 for the determination of the flammability by tests or by calculation, the definition of flammable gases in that standard does not correspond to the definition in the UN Recommendations. He quoted paragraph 3.1.1 of ISO 10 156:1990:

"Gas or gas mixture flammable in air: a gas or gas mixture which will ignite in air at atmospheric pressure and a temperature of 20 °C".

He also quoted paragraph 4.1 of ISO 10 156:1990:

> "Gases and gas mixtures which are flammable shall be designated in accordance with ISO 5145:1990 - annex A - category I - subdivision 2. Such gases and gas mixtures have flammable limits in air."

However, it was noted that the current reference to ISO 10156 in the UN Recommendations refers only to the test procedures.

8. After discussion, it was agreed that:

(a) It would not be suitable to refer to a specific value of the atmospheric pressure in the definition;

(b) A general definition for a first hazard level should be developed on the basis of the proposal by Germany or the definition in ISO 10 156:1990 (two definitions in square brackets for final decision at the next session, see annex to this report);

(c) A second more stringent hazard level would be defined by a cut-off limit corresponding to the definition in the UN Recommendations which could be used by specific regulatory systems.

9. It was also agreed that the cases of methyl bromide and ammonia should be considered separately by regulatory systems because of the controversy on the real flammability risk presented by those gases (e.g. high energy required for igniting ammonia, see also special provision 23 in chapter 3 of the UN Recommendations).

Aerosols

Documents : ST/SG/AC.10/C.3/R.590 (United States)
INF.12 (Norway)

10. The expert from the United States proposed a method for classifying aerosols as flammable. This method is already included in the ICAO Technical Instructions for the Safe Transport of Dangerous Goods.

11. The expert from Germany said that the test proposed in that method is also expected to be acceptable for determining the flammability of aerosols in the context of EC legislation for supply systems, but that under that legislation all aerosols containing a flammable gas or flammable components would be considered as flammable at first sight.

12. In INF.12, the expert from Norway proposed that aerosols should be considered as flammable whenever the propellant gas is flammable and that the test should be required when the propellant gas is non-flammable unless it is known that all the contents of the aerosol are non-flammable.

13. The representative of India stated that aerosols was state and that classification will have to be actually based on the characteristics of the contents.

14. The expert from Italy expressed the view that aerosols were articles and that the danger presented by these articles was related to the containment system rather than to the intrinsic properties of the contents. Therefore he felt that this problem should not be considered under the process of harmonization.

15. It was recalled that aerosols are consumer commodities widely used and transported throughout the world. If the danger caused during storage and transport is mainly related to the fact that they are pressure receptacles which may explode in case of fire engulfment, the fire risk in case of leakage or when used is important. Moreover, with the phasing out of CFC, flammable propellants such as propane and butane are increasingly used. There was also a clear decision in Ottawa that aerosols should be included in the harmonization process, and this was reconfirmed by the group.

16. The Chairman said that the various possible contents should be taken into account (i.e. flammable propellant with no other flammable components, flammable propellant with flammable components, non-flammable propellant and flammable components including liquids).

17. No decision could be made on whether or not the type of containment should be taken into account, and it was agreed that this question (including exemptions depending on the size of articles) should rather be discussed independently of the flammability of aerosols.

18. The expert from the United States said that he would prepare a proposal for the next session on criteria for the flammability of aerosols, taking account of the comments made and of the proposal by Norway in INF.12.

CLASSIFICATION CRITERIA FOR FLAMMABLE LIQUIDS

Documents : ST/SG/AC.10/C.3/R.648 (Secretariat), ST/SG/AC.10/C.3/R.659 (Argentina), ST/SG/AC.10/C.3/R.674 (Germany), ST/SG/AC.10/C.3/R.677 (Germany), ST/SG/AC.10/C.3/R.701 (United States), INF.45 (Germany)

Upper cut-off limit

19. The Chairman recalled that at its last session the Working Group could not decide whether the upper cut-off value would be 93 °C as in the United States (corresponding to 200 °F) or 100 °C as in certain national regulatory systems in Europe.

20. The expert from the United States said that he would prefer to adopt the 93 °C value, because it corresponded to the value in force in his country and he was not convinced that the 100 °C was representative of major classification systems in Europe. The expert from Canada also preferred a value of 93 °C at this time.

21. The discussion showed that both values had probably been chosen because they are round figures either in °C or °F, and that there would be no substantial difference as regards the safety level in adopting one or the other value. In response to a question by the expert from Canada, the representative of HMAC said however that raising the 93 °C value to 100 °C would affect a number of blended products traded in North America.

22. The expert from the United States said that he could accept a compromise on a value of 90 °C.

23. As no decision could be made on this subject, experts from North America were invited to check carefully what products would be concerned by a rise of the 93 °C value to 100 °C and what the exact consequences would be. On the other hand it should also be checked to what extent the 100 °C value is used, in which countries and which regulatory systems, and experts from these countries should also evaluate the consequences of a lower limit of 93 °C or 90 °C, so that a final decision could be made at the next session. The Chairman suggested that Industry should also consider possible effects from reformulating the products concerned.

60 °C flashpoint cut-off limit

24. The suitability of the 60 °C flashpoint as a cut-off limit was confirmed. The group noted however that certain petroleum products such as gas oil, diesel fuel, light heating oil may present flashpoints which may vary from 55 °C to 75 °C from batch to batch in the manufacturing process or depending on the season. For practical reasons, whatever the regulatory system, the petroleum industry would prefer that such products be subject to the same requirements whatever their exact flashpoint.

25. Several experts felt that it would not be logical to apply the requirements applicable to a product with a flashpoint less than 60 °C if the manufacturer can prove by testing that the product has a flashpoint above 60 °C.

26. Other experts referred to the European land transport regulations (RID/ADR) where these petroleum products are treated as dangerous goods even if their flashpoint is above the upper transport limit cut-off value of 61 °C.

27. It was agreed that the 60 °C flashpoint cut-off value should be retained, and that it might be necessary to further consider the case of gas oil, light heating oil and diesel fuel as a special group of products under each regulatory system.

Heated substances

28. It was recognized that substances heated up to a temperature at or above their flashpoint, or even at a temperature within the range of 15 °C below the flashpoint when carried or stored in bulk quantities, present a flammability risk. However it was agreed that it would not be necessary to develop harmonized criteria for heated substances as the criteria should be considered on a case by case approach, depending on the manufacture process, the quantity carried or stored, the regulatory system.

23 °C flashpoint cut-off limit

29. The suitability of the 23 °C flashpoint cut-off limit was confirmed.

Lower cut-off limit

Documents : ST/ST/AC.10/C.3/R.648 (Secretariat), ST/SG/AC.10/C.3/R.674 (Germany), ST/SG/AC.10/C.3/R.701 (United States)
INF.45 (Germany)

30. At the last session, the group had agreed that the different hazard levels should be based on flashpoint cut-off values. However for the lower cut-off value, the group felt that further information was necessary to establish a correlation between the initial boiling point (as the initial boiling point of 35 °C is used as a cut-off value at present in transport regulations and several work safety and supply regulations, including EC legislation) and the flashpoint, so as to determine which of the two values - 18 °C or 0 °C could be used in an harmonized system.

31. Document ST/SG/AC.10/C.3/R.648 discussed the classification used in existing transport regulations and direct correlation between the initiai boiling point and the flashpoint, and should that adoption of - 18 °C or 0 °C as a single value for the lower cut-off limit instead of the present initial boiling point of 35 °C would imply reclassification of many products in all systems and significant reallocation of requirements. It was noted that substances with a boiling point less than 35 °C would have in most cases a flashpoint less than 0 °C, but not all substances with a flashpoint less than 0 °C would have necessarily a boiling point less than 35 °C.

32. In document ST/SG/AC.10/C.3/R.701, the expert from the United States stated that a study of the correlation of the initial boiling point of 35 °C and the flashpoint of - 18 °C showed a margin of error of $\pm$ 27 °C and therefore it would not be appropriate, in this harmonization process, to consider that there is correlation between these two values.

33. The expert from Germany proposed in ST/SG/AC.10/C.3/R.674 to use the flashpoint value of - 18 °C as the lowest cut-off limit because substances with a flashpoint below - 18 °C are more likely to form an explosive atmosphere in air in case of spillage than those with a flashpoint between - 18 °C and 23 °C.

34. Several experts felt that there was no reason to use only flashpoints as cut-off limits, as the boiling point is also an intrinsic property of substances. Furthermore they felt that the initial boiling point was also representative of the likelihood of formation of explosive atmospheres in case of spillage, especially in normal conditions of temperature.

35. The representatives of CEFIC and CEPE (INF.3) stressed the difficulty of determining an exact initial boiling point in the case of preparation and mixtures, as well as the cost of the test. They proposed to use the flashpoint test with a cut-off value of - 18 °C as a preliminary test which would be easier to perform for such mixtures. This would cover substances having a flashpoint below 23 °C and initial boiling point below 35 °C based on the analysis presented in ST/SG/AC.10/C.3/R.648 and additional comments by the United Kingdom for lists Nos. 4 and 5.

36. The representative of IMO said that the - 18 °C flashpoint value was used by IMO only for the purposes of stowage of dangerous goods on board ship. She said that IMO could still use this value for these purposes even if it were not included as a possible cut-off limit in the harmonized system, as stowage is an operational matter and indication of the flashpoint in the transport document is required.

37. In view of the uncertainty of the correlation between a 35 °C initial boiling point and a - 18 °C flashpoint, and of the significant changes to the existing classifications and corresponding assignment of technical requirements in case of adoption of a - 18 °C flashpoint as a single lower cut-off limit, the group agreed that the lower cut-off limit should be the initial boiling point of 35 °C in conjunction with a flashpoint below 23 °C. The group agreed that the - 18 °C flashpoint value could be retained in square brackets as an additional possible criterion.

38. The expert from the Netherlands said that substances with a boiling point above 35 °C and a flashpoint below - 18 °C may also be regarded as very dangerous in use and that he might be necessary to take that into account.

Definition of terms

Document : ST/SG/AC.10/C.3/R.677 (Germany)

39. The representative of the European Commission felt that it was too early to discuss the possible wording for defining the various hazard levels, when the cut-off limits have not yet been defined. The use of the words "high danger", "low danger" ... in the context of harmonization was also questioned by Australia, as well as the need for defining ("very low danger") substances which fall beyond the upper cut-off limit. It was agreed that this question should be discussed at a later stage. The Chairman offered to revise document ST/SG/AC.10/C.3/R.677 in accordance with the comments made.

Use of other intrinsic properties for cut-off limits

Document : ST/SG/AC.10/C.3/R.659 (Argentina)

40. The group noted that the auto-ignition temperature is used as a criterion in regulations concerning the transport of flammable liquids in bulk by sea or inland waterways. However, it was underlined that this criteria is used only for the purpose of design and equipment of chemical tankers and therefore the group felt that it would be inappropriate to take account of such a criterion in the harmonized system.

41. The expert from Argentina noted that non-technical factors had been put forward in the discussion of cut-off limits for flammable liquids. Comments on this issue were contained in paragraph 3 of this document ST/SG/AC.10/C.3/R.659.

Flashpoint calculation for solvent containing preparations

Document : INF.47 (CEPE)

42. The representative of CEPE introduced a document containing basic principles which could be used for the calculation of flashpoints of preparation containing solvents. It was agreed to refer that document to the CEFIC work on Screening test procedures.

Relaxation criteria

Document : INF.5 (CEFIC)

43. The group agreed that the question of exemptions should be addressed separately by each regulatory system and therefore felt inappropriate to include exemption criteria on the basis of combustibility or viscosity tests in the harmonized system.

CLASSIFICATION CRITERIA FOR FLAMMABLE SOLIDS

Document : ST/SG/AC.10/C.3/R.675 (Germany)

44. It was recalled that the group had previously agreed to use the test method of the Recommendations on the Transport of Dangerous Goods for the harmonized approach (see ST/SG/AC.10/C.3/20/Add.2, Part. II, para. 36).

45. In document ST/SG/AC.10/C.3/R.675, the expert from Germany proposed:

1. to increase the duration of the preliminary screening test from 20 minutes to 40 minutes;

2. to increase the duration of the burning rate test from 10 minutes to 20 minutes.

46. It was also recalled that the test which had been originally developed by the UN Committee of Experts on the Transport of Dangerous Goods in 1988 was now widely implemented not only in transport regulations but also in storage/supply regulations throughout the world. However, for the test included in the EC supply legislation system, the length of the preliminary screening test was 40 minutes rather than 20 minutes, and this is the only variation from the UN test.

47. The group considered that the duration of 20 minutes should remain for the preliminary screening test. The requirement for a 40 minute test in EC legislation would have no effect on the final classification.

48. For the proposal to increase the duration of the burning rate test from 10 minutes to 20 minutes, the group felt that this was a substantial proposal affecting all existing systems, which would require appropriate justification and which could not be supported in the context of harmonization of existing systems.

ADOPTION OF THE REPORT

49. The Working Group adopted the report on its second session together with its annex.

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Table 1: Testing Methods and definitions

Testing methods		
testing methods for flashpoint determination	closed cup methods preferred, open cup methods only acceptable in special cases	ISO-work to be considered, "special cases" to be determined (after additional research)
(Draft) Definition of flammable liquids		
liquids to gases	vapour pressure at 50 °C > 300 kPa or completely gaseous at 20 °C (at standard pressure of 101.3 kPa)	
liquids to solids	melting point ≤ 20 °C at 101.3 kPa or for viscous substances without a defined melting point, tested according to ASTM D 4359-90 or penetrometer as prescribed in Annex A.3 ADR with penetrometer according to ISO 2137:1985	

Table 2: (Draft) Hazard levels of the classification of flammable liquids

Level	Uniform hazard description	Characteristics	Remarks
Very high danger	to be developed	Initial boiling point ≤ 35 °C Flashpoint < 23 °C	(envisaged for packing group I in transport) Possible additional criteria for flashpoint < - 18 °C envisaged
high danger	to be developed	flashpoint < 23 °C, initial boiling point > 35 °C	(envisaged for packing group II in transport)
medium danger	to be developed	flashpoint 23 °C - 60 °C	(envisaged for packing group III in transport)
low danger	to be developed	flashpoint > 60 °C and [≤ 100 °C] [≤ 93 °C] [≤ 90 °C]	Further investigation needed - Case of light heating oil, gas oil and diesel fuel might have to be further considered separately by each regulatory system

Table 3: (Draft) Hazard levels for flammable solids

Level	Uniform hazard description	Criteria	Remarks
high danger	-	not applicable	
medium danger	to be developed	method as described in section 33 of the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria screening test: testing time 2 min (20 min for metal powders) burning rate test: time < 45 s or rate > 2 mm/s or ≤ 5 min for metal powders wetted zone does not stop fire	(for transport envisaged for packing group II)
low danger	to be developed	method and test as described before wetted zone stops the fire for at least 4 minutes burning rate test time more than 5 mn and less than 10 mn for metal powder	(For transport envisaged for packing group III)

Table 4:(Draft) Hazard levels of the classification of flammable gases

Level	Uniform hazard description	Characteristics	Remarks
high danger [very high danger]		gases which at 20 °C and a standard pressure of 101.3 kPa (a) are ignitable when in a mixture of 13 % or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit. Flammability should be determined by tests or by calculation in accordance with methods adopted by ISO (see ISO 10156:1990). Where insufficient data are available to use these methods, tests by a comparable method recognized by a national competent authority may be used.	
[high danger]		[Gas or gas mixture which will ignite in air at atmospheric pressure and a temperature of 20 °C] [Gases or gas mixtures, which under normal conditions of temperature and pressure, have [an explosion range][flammable limits] [in mixture with air]	Wording of definition to be further considered. See also ISO 10 156:1990 and ISO 5145:1990